

an analyzer in communication with said wave launcher and adapted to generate said input waveform, and to receive said reflected component of said input waveform from said wave launcher, and

a processor in communication with said analyzer and adapted to compare said input waveform with said reflected component of said input waveform to determine a characteristic of said pipeline,

wherein the wave launcher, the analyzer, and the processor operate in a fashion that is non-invasive to the pipeline.

29. (Amended) A method of inspecting a characteristic of a pipeline, said method comprising, transmitting an input waveform having a selected input energy along a longitudinal axis of said pipeline,

receiving a reflected component of said input waveform from said pipeline, said reflected component having a characteristic reflected energy, and

comparing said input waveform with said reflected component of said input waveform to determine said characteristic of said pipeline,

wherein the transmitting, receiving, and comparing steps occur in a fashion that is non-invasive to the pipeline.

55. (Amended) A method of determining a location of a point along a pipeline, said method comprising,

transmitting an input waveform having a selected input energy along a longitudinal axis of said pipeline,

receiving a reflected component of said input waveform from said pipeline, said reflected component having a characteristic reflected energy, and

comparing said input waveform with said reflected component of said input waveform to determine said location of said point along said pipeline,

wherein the transmitting, receiving, and comparing steps occur in a fashion that is non-invasive to the pipeline.

56. (Amended) A method of inspecting a characteristic of a pipeline, said method comprising,

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transmitting an input waveform having a selected input energy along a longitudinal axis of said pipeline,  
receiving a reflected component of said input waveform from said pipeline, said reflected component having a characteristic reflected energy, and  
determining said characteristic of said pipeline using an error estimate, said error estimate depending on a known point along said pipeline relative to said characteristic,  
wherein the transmitting, receiving, and determining steps occur in a fashion that is non-invasive to the pipeline.

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58. (Amended) A method of inspecting a characteristic of a pipeline, said method comprising,  
generating an input waveform,  
launching said input waveform into said pipeline,  
receiving from said pipeline a reflected component having a characteristic reflected energy of said input waveform,  
calculating a mathematical function of said characteristic reflected energy from said reflected component of said input waveform,  
determining a model mathematical function of model reflected energy from a model component of a model input waveform, and  
determining said characteristic of said pipeline by comparing said mathematical function of said reflected energy to said model mathematical function of said model reflected energy,  
wherein each step is performed in a fashion that is non-invasive to the pipeline.

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